

**Patent Claims**

1. A static mixing device (1), containing

- at least one first mixing element (A) which on a  
5 front side (V) has a plurality of, in particular,  
parallel ducts (2) transversely, in particular  
orthogonally, to a main flow direction (H), the  
ducts (2) not being connected to one another, but  
having passage orifices (3) in the main flow  
10 direction (H); and
- at least one second mixing element (B) which is in  
contact with the first mixing element (A) and which  
has on a front side (V) a plurality of, in  
particular, parallel ducts (2) transversely, in  
15 particular orthogonally, to the main flow direction  
(H), the ducts (2) being connected to one another;  
in the ducts (2), in particular in side walls of the  
ducts (2), orifices (4) being provided which allow  
the passage of a medium in the main flow direction  
20 (H) from the ducts (2) of the front side (V) to the  
rear side (R) of the second mixing element (B); and,  
on a rear side (R) of the second mixing element (B),  
a plurality of, in particular, parallel ducts (2),  
which are not connected to one another, being  
25 arranged orthogonally to the main flow direction  
(H),

the ducts (2) of the first mixing element (A) and of  
the second mixing element (B) being arranged in such a  
way that a passage of a medium through the mixing  
30 elements (A, B) is made possible.

2. The mixing device (1) as claimed in claim 1,  
characterized in that the first mixing element (A) has  
the following features:

- 35 • the passage orifices (3) of adjacent ducts (2) are  
arranged in each case in opposite halves of the  
front side of the mixing element (A);

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- no passage orifices (3) are arranged in a middle region of all the ducts (2);

and/or the second mixing element (B) has the following features:

- 5 • on a front side (V), the ducts (2) are connected to one another by means of a common connecting duct (5) which is arranged in such a way that its position corresponds essentially to a rear-side region which is free of passage orifices (3);
- 10 • in the region between a first side of the connecting duct and an outer edge of the second mixing element, passages are arranged which are not connected to the front-side ducts;
- 15 • in the region between a second side of the connecting duct and an outer edge of the second mixing element, passage orifices are provided which are connected to the ducts.

20 3. The mixing device (1) as claimed in claim 1 or 2, the first and second mixing elements (A, B) being arranged alternately.

25 4. The mixing device (1) as claimed in one of the preceding claims, the first and second mixing elements (A, B) being designed as stackable plates.

30 5. The mixing device (1) as claimed in either one of claims 3 and 4, characterized in that the first and second mixing elements (A, B) are stacked, rotated in relation to one another at an angle ( $\alpha$ ) with respect to a comparable structural feature present on both mixing elements, in particular with respect to parallel ducts (2).

35 6. The mixing device (1) as claimed in one of claims 3 to 5, characterized in that

- a second mixing element (B) follows a first mixing element (A) in the main flow direction (H), the

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ducts (2) of this preceding first mixing element (A) being arranged parallel to the rear-side ducts (2) of the second mixing element (B);

and in that

- 5 • a first mixing element (A) follows a second mixing element (B) in the main flow direction (H), the ducts (2) of this following first mixing element (A) being oriented at an angle ( $\alpha$ ) of  $90^\circ$  with respect to the rear-side ducts (2) of the second mixing  
10 element (B).

7. The mixing device (1) as claimed in one of claims 3 to 6, characterized in that the sequence of the first and second mixing elements (A, B) contains  
15 paired arrangements (x, x+1, x+2, ..., x+n) of the first and second mixing elements (A, B), in each of the paired arrangements (x, x+1, x+2, ..., x+n) the ducts (2) of the first mixing element (A) being oriented parallel to the rear-side ducts (2) of the second  
20 mixing element (B), but the ducts of a following paired arrangement (x+1) being arranged, rotated in each case at an angle ( $\alpha$ ) of  $90^\circ$  with respect to a preceding arrangement (x), in the main flow direction (H).

25 8. The mixing device (1) as claimed in one of the preceding claims, characterized in that the mixing elements (A, B) have means, in particular bosses and clearances, for rotationally fixed stacking, in particular, at an angle ( $\alpha$ ) of  $90^\circ$  or an even-numbered  
30 multiple of  $90^\circ$ .

9. The mixing device (1) as claimed in one of the preceding claims, characterized in that an entry piece (8) is provided upstream of a first mixing element (A, B) in the main flow direction (H), and an end piece (9) is provided downstream of a last mixing element (A, B) in the main flow direction (H).  
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10. The mixing device (1) as claimed in one of the preceding claims, characterized in that the mixing elements (A, B) and, if appropriate, the entry piece (8) and/or the end piece (9) are arranged, in particular exchangeably, in a sleeve (10).

11. The mixing device (1) as claimed in claim 10, characterized in that the sleeve (10) is closed, in particular reversibly, by means of a connection piece (11) for connection to a discharge device and/or is designed to be closable.

12. A supply container, in particular a multichamber tubular bag, having at least two compartments, characterized in that, in particular, a mixing device (1) as claimed in one of claims 1 to 11 is connectable or connected releasably or fixedly to the supply container.

13. A discharge device for the outlet of at least two substances to be mixed from a supply container having at least two compartments, in particular a multichamber tubular bag, characterized in that an outlet of the supply container is connectable or connected essentially directly to a static mixing device (1) particularly as claimed in one of claims 1 to 11.

14. A method for the discharge of at least two substances to be mixed, in particular, from a supply container having at least two compartments, characterized in that the mixing of the substances takes place essentially by means of a static mixing device (1) particularly as claimed in one of claims 1 to 11.

15. The use of a mixing device (1) as claimed in one of claims 1 to 11 for the mixing of at least two substances stored in a supply container having at least

two compartments, the mixing device (1) being arrangeable or arranged releasably or fixedly on the supply container or a discharge device.

- 5 16. The use as claimed in claim 15, characterized in that the discharge device is a commercially available discharge device for the outlet of single-component or multicomponent mixtures from an exchangeable supply container.